

Report Purpose and Scope

This Report was prepared as required by Assembly Bill 2231 (Pavley, Government Code Section 8593.6). The legislation required that the Office of Emergency Services (OES) convene a Working Group "to develop policies and procedures that will provide a framework for instituting a public-private partnership with providers of mass communications systems to enhance public access to emergency alerts". The Working Group was also tasked with "assessing existing and future technologies available in the public and private sectors for the expansion of transmission of emergency alerts to the public" and to provide advice to the OES Director on development of policies and procedure that "will lay the framework for an improved warning system for the public".

Specifically, the statute requires the Working Group to consider and make recommendations with respect to all of the following:

- Private and public programs, including pilot projects that attempt to integrate a public-private partnership to expand an alert system.
- Protocols, including formats, source or originator identification, threat severity, hazard description, and response requirements or recommendations, for alerts to be transmitted via an alert system that ensures that alerts are capable of being utilized across the broadest variety of communication technologies, at state and local levels.
- Protocols and guidelines to prioritize assurance of the greatest level of interoperability for first responders and families of first responders.
- Procedures for verifying, initiating, modifying, and canceling alerts transmitted via an alert system.
- Guidelines for the technical capabilities of an alert system.
- Guidelines for technical capability that provides for the priority transmission of alerts
- Guidelines for other capabilities of an alert system.
- Standards for equipment and technologies used by an alert system.
- Cost estimates.
- Standards and protocols in accordance with, or in anticipation of, Federal Communications Commission requirements and federal statutes or regulations.

- Liability issues.

Alert and Warning Background

"Timely and effective public warnings can save lives, reduce property losses and speed economic recovery. Public warning empowers citizens by providing them with the information they need during times of emergency to make informed decisions. The objective of a public warning system is to capture the attention of people at risk, to provide them with relevant and accurate information regarding the nature of the threat and to provide such information in time for protective actions to be taken. A truly effective public warning system will reach those at risk regardless of their location, time of day or night or any disabilities or special needs."

Partnership for Public Warning, Protecting America's Communities, June 2004

The process of issuing a public alert or warning includes several key elements:

- Evaluating the emergency situation and identifying/assessing the risk
- Deciding to issue a warning
- Crafting the warning message
- Disseminating the warning
- Validating the warning
- Taking action on the warning.

Alert and warning policies and procedures, including guidelines for when a warning should be issued and who is able to issue a warning, need to be developed ahead of time and included in jurisdiction Emergency Operations Plans. The public must also be educated about available alerting and warning systems and appropriate action to take when a warning is received. Alerting systems must also be tested regularly and tests evaluated to provide feedback for system improvements.¹

It is important to differentiate "alert and warning" from "public information". If necessitated by the incident, making a recommendation to the Incident Commander/Emergency Manager regarding issuance of an alert is a function of the

¹ Partnership for Public Warning, Protecting America's Communities: An Introduction to Public Alert and Warning, June 2004 (PPW Report 2004-2)

Operations Section of incident management. Issuing an alert is an initial response action, requiring rapid decision-making, often in an environment of uncertainty. For example, calling for an evacuation as a result of a hazardous materials release will require activation of the local alert system before the incident public information officer structure is in place. The alert will often refer recipients to public information sources (such as media releases, internet postings) for follow-up information. This differentiation of function must be reflected in operation and maintenance of the alert and warning system, including governance, training, and credentialing.

There has been considerable academic research on public response to alerts and warnings.² There are several "myths" related to public reaction to warnings, which have been disproven in the academic research:

- "Panic" -- people do not panic in response to warnings, particularly well worded warnings,
- "Keep it simple" -- actually, recipients want a lot of accurate information in the warning message, if not they will search for it from other sources, and
- "False alarms" -- while an adequately explained false alarm may not deter future behavior, irrelevant alarms may have this effect -- the "car alarm" syndrome.

The elements of the warning message are key in influencing the public to take the proper response:

- The message should come through multiple, diverse channels;
- The more it is repeated and heard the better;
- The content should include who is making the recommendation, , who should follow the recommendation, why they should do it, what they should do, and when they should do it,;
- The message style should be clear, specific, accurate, certain, and consistent;
- The warning should come from a credible source, and credibility may vary between elements of the population to be warned.

Most recipients will want to validate the information before taking action. The message should refer recipients to preferred sources for validation (e.g., tune to your local radio station, reference an official website, refer them to 2-1-1 or 3-1-1 operators). If this reference is not provided in the message, recipients needing additional information will call 9-1-1, tying up emergency circuits when they are needed most. Additionally, 9-1-1 dispatchers may not be able to provide additional public information.

² Information in the following paragraphs derived from Dennis S. Mileti and Erica Kuligowski, "Public Warnings and Response: Research Findings and Evidence Based Applications for Practice", Power Point presentation (revision 12C), no date

In order to take appropriate action in response to an alert, the public must understand the warning process. Therefore, a comprehensive public education program is an essential part of an effective alert and warning system.

National Alert and Warning Initiatives

There are several on-going alert and warning initiatives at the national level:

Migration to Common Alerting Protocol (CAP)

The objective of the Common Alerting Protocol (CAP) is to define “a single message format with the essential features to handle existing and emerging alert systems and sensor technologies.”³ CAP was adopted by the Organization for the Advancement of Structured Information Standards (OASIS) in 2004. CAP allows the sender of an alert message to activate many types of warning systems with a single input, thus ensuring a common message is sent to as many warning devices as possible. In structuring the message format protocol the standards crafters based the template on findings of academic research and real-world events. The structure includes four general groups of message components⁴:

- **Alert:** This group of message elements includes such essential elements as the originator of the message, the date/time it was sent, its status (e.g., actual warning, exercise warning, system test), scope (e.g., public audience, restricted audience, or private), and message type (e.g., alert, update, cancel).
- **Info:** This group of message elements includes the event, urgency of the event/alert (e.g., action should be taken immediately, soon, or near future), severity of the event (e.g., extreme, severe, moderate, minor), and certainty of occurrence (e.g., very likely, likely, possible, unlikely).
- **Resource:** Allows for inclusion of additional information to enhance the elements under the “Info” section.
- **Area:** A text description of the impacted area.

Commercial Mobile Alert System (CMAS)

In April 2008, the Federal Communications Commission (FCC) adopted rules effective September 22, 2008 for the Commercial Mobile Alert System (CMAS), a system by which mobile service (e.g., cellular telephone) providers will relay authenticated emergency

³ CAP Fact Sheet, CAP Cookbook, www.incident.com

⁴ OASIS [Common Alerting Protocol](#), v. 1.0, p. 9-19, describes all required and optional message components.

messages and alerts to their mobile device customers. The creation of the system was mandated by the Warning Alert Response Network (WARN) Act, enacted in 2006. Participation in the CMAS will be voluntary on the part of commercial mobile service (CMS) providers. However, the major nationwide wireless service providers have indicated they will participate in CMAS. Customers will automatically receive a text message alert when issued by authenticated government sources. Messages will be targeted to the County level.

A key role in the functioning of the CMAS is the "Alert Aggregator". According to the FCC summary of CMAS⁵, the Alert Aggregator "would receive, authenticate, validate and format Federal, state, tribal and local alerts and then forward them to the appropriate CMS Provider Gateway. The CMS Provider Gateway and associated infrastructure would process the alerts and transmit them to subscriber handsets." Until recently, it had been unclear which federal agency would take on this Alert Aggregator role. However, on May 30, 2008 the Federal Emergency Management Agency (FEMA) announced that it would take on the Alert Aggregator role, subject to several conditions. Of particular interest to the State, FEMA indicated that "the federal Aggregator will interface, but not interfere with, existing state and local alerting systems" and that "states would be responsible for determining and identifying those persons who have the authority to send alerts for their specific jurisdictions". According to the FEMA release, the system by which this Alert Aggregator would perform its function has not yet been designed or engineered.⁶ FEMA's Government Interface specifications are due by the end of 2008⁷.

Integrated Public Alert and Warning Systems (IPAWS) and the Emergency Alert System (EAS)

In June 2006 President Bush issued an Executive Order stating that it is the policy of the United States to have "an effective, reliable, integrated, flexible and comprehensive system to alert and warn the American people."⁸ The Integrated Public Alert and Warning System (IPAWS) is a federal public-private initiative, coordinated by Department of Homeland Security/FEMA, to address this mandate. It is to establish "next generation public communications and warning capability...to allow the

⁵ Federal Communications Commission, Public Safety and Homeland Security Bureau website, "Mobile Telephone Alerts"

⁶ Federal Emergency Management Agency, "FEMA to Assume Aggregator/Gateway Role for nationwide Cell Phone Alert System", May 30, 2008, release number HQ-08-090

⁷ FCC Third Report and Order PS Docket no. 07-287, August 7, 2008

⁸ Executive Order 13407, "Public Alerts and Warning System", signed by President George W. Bush, June 26, 2008.

President and authorized officials to effectively address and warn the public and State and local emergency operations centers via phone, cell phone, pager, computers and other personal communications devices.”⁹ It will use digital technology to send emergency alert data to a variety of media and devices. It will allow messages to be transmitted in audio, video, and text and in multiple languages including American Sign Language and Braille.¹⁰

IPAWS will primarily update the existing Emergency Alert System (EAS), which relies on broadcast television and radio, and National Oceanic and Atmospheric Administration Weather Radio Network. FEMA is statutorily responsible for the EAS and has designated the FCC to coordinate broadcaster participation. (Broadcasters are mandated to participate in national level alerts but participation in State and local level alerts are voluntary. However, this has not been a problem in California.) Under the current EAS, the alert messages are relayed to the “Primary Entry Point”, who then relays it to other radio and television stations for rebroadcast.¹¹ Due to its size, California has a primary (KCBS, San Francisco) and secondary (KFWB, Los Angeles) “Primary Entry Point”, and a designated “State Entry Point” (KFBK, Sacramento). California has 23 local EAS areas, each with a primary local entry point. Local EAS areas are identified in Appendix __ to this report.¹²

The United State House of Representatives Subcommittee on Economic Development, Public Buildings, and Emergency Management held a hearing on June 4, 2008 that addressed the status of IPAWS. It noted that FEMA is conducting 14 pilot projects throughout the nation to develop various aspects of the IPAWS. The staff report¹³ notes that many of the pilot projects are concluding, yet there does not seem to be a clear plan and timeline for IPAWS implementation.

⁹ Federal Emergency Management Agency website, “Integrated Public Alert and Warning System”, “What is IPAWS?”

¹⁰ Federal Emergency Management Agency website, “Integrated Public Alert and Warning System”, “What IPAWS Does”

¹¹ Memorandum from Committee on Transportation and Infrastructure Oversight and Investigations Staff to Members of the Subcommittee on Economic Development, Public Buildings, and Emergency Management, Subject: Hearing on “Assuring Public Alert Systems Work to Warn American Citizens of natural and Terrorist Disasters”, June 3, 2008, pages 1-2.

¹² State of California Emergency Alert System, State EAS Plan, November 2002.

¹³ See footnote 8, pages 4-5

Follow-up legislation, the “Integrated Public Alerts and Warning Systems Modernization Act of 2008” (H.R. 6038) was introduced in the US House of Representatives in May 2008. It amends the Robert T. Stafford Act to direct the President to modernize the alert and warning system. It memorializes in statute much for the current IPAWS, CAP implementation, and CMAS initiatives and the directives of the Executive Order 13407.

State Level Alerting and Warning History in California

Emergency Digital Information Service (EDIS)

The Emergency Digital Information Service (EDIS) is a “state operated public warning system that links emergency managers to the news media, public, and other agencies. It is part of the state’s Emergency Alert System (EAS) and is available without charge to local, state, and federal agencies serving California.”¹⁴ EDIS is comparably inexpensive to operate, is reliable, and is acknowledged as an official source of information. EDIS is a “backbone” or integration system, allowing messages generated by authorized agencies throughout the state to be distributed to areas in the state that need to receive the warning. EDIS can also potentially serve as a “subaggregator” under CMAS, if such a function is authorized under the federal regulations.

EDIS has been in operation since 1990 and provides text-based information to news media, emergency managers, and other users via the Internet to email, computer desktop, or text-enabled mobile devices in near real time. EDIS can also be used to transmit warning messages to the EAS, which then broadcasts them to the public via television or radio. EDIS is fully compatible with CAP, enabling “plug and play” with other CAP-compliant means of issuing alerts and warnings. Messages are created on the Internet, allowing authorized operators to create them at any location with Internet access. EDIS has the capability to work with Geographic Information Systems (GIS) to target warning delivery. EDIS can be used as the nucleus of an expanded local, regional, and state alert and warning system in California. An EDIS fact sheet is included as Appendix __ to this report.

Survey of Existing Alert and Warning Systems Used in California (OES Technology Contract)

¹⁴ California Governor’s Office of Emergency Services, Emergency Digital Information Service Fact Sheet (no date).

The Governor's Office of Emergency Services (OES) is soliciting offers for services to assist with the development of a statewide strategy for enhancement of systems and protocols for alerting the general public and public officials of potential emergencies ranging from tsunamis to chemical spills. The intent is for the contractor to:

- Create a state strategy for multi-year improvement of the technology, protocols, and policies for notifying the public and public officials in emergency situations of actions necessary to relocate themselves or take other protective measures.
- Provide technical assistance to OES and its various advisory committees relative to the development and implementation of emergency alert and warning systems.
- Create a training curriculum that will aid emergency personnel in effectively using alert and warning systems.

CA-OES is currently going through the process of hiring a consultant to accomplish this task. There are currently six proposals that are being considered. However, the contract cannot be finalized before the State budget is signed.

Assembly Bill 2393

AB 2393 (Levine), regarding telecommunications emergency backup power and notification systems, requires the California Public Utilities Commission (CPUC) to investigate certain aspects of alert and warning via telephone devices. AB2393 is a legislative mandate directing the CPUC has to investigate current capabilities, best practices and the value of establishing standards for emergency alerting in California. This effort recognizes the growing importance of mobile telephones and the growing number of Californians who rely **exclusively** on mobile service for voice telecommunications.¹⁵

Standardized Emergency Management System (SEMS)

The Standardized Emergency Management System (SEMS) is the system required by Government Code Section 8607(a) to be used in California to manage emergencies involving multiple jurisdictions and multiple agencies. SEMS incorporates the concepts of the Incident Command System, the Master Mutual Aid Agreement, the operational area concepts, and multi-agency coordination. It involves five levels: Field, local, operational area, region, and state. Standardization of the system is intended to

¹⁵ Because of its standing as a leader in emergency communications, large population, and unique topographical and demographic challenges, California is ideally suited to test the Commercial Mobile Alert System (CMAS) through a First Office Application (FOA), the goal of which will be to identify obstacles, solutions and best practices for a nationwide rollout of this technology. An expansion of EDIS could be an FOA for which California can apply. See CPUC docket R.07-04-015.

facilitate the flow of information between the various levels and facilitate coordination among responding agencies.¹⁶ Although SEMS does not specifically address alert and warning, it is the system accepted by California's emergency management community for addressing common approaches to emergency response, including standardized training.

A key concept in SEMS is the "Operational Area". Under SEMS, the operational area means "an intermediate level of the state's emergency management organization which incorporates the county and all political subdivisions located within the county....The operational area manages and/or coordinates information, resources, and priorities among local governments within the operational area and serves as the coordination and communications link" between local governments and the region and state levels.¹⁷ SEMS relies heavily on the Operational Area level to implement emergency management initiatives at the county-wide level.

Local Alerting and Warning Activity

(Local government work group members – please review this section)

Overview

At the local government level, alert and warning options are varied and have mixed capabilities. There is the Emergency Alert System (EAS), with its short alert notification tones and messages that may be easily missed by the potential audience. Some jurisdictions use automatic dial/send telephonic emergency notification systems. Recent events have highlighted issues with these systems; notification is not always received due to operational or network issues. Emergency Digital Information Service (EDIS) is a system that relies on broadcasters and here again there are occasional technical difficulties, depending upon how the broadcast stations operate. A small number of locations use outdoor sirens as part of their alerting process. Depending on the frequency of testing, testing the siren systems may be accompanied by 9-1-1 calls from people asking "Is this real? Is this a test?"

Some of these systems have their limitations. EAS provides an initial alert, but must be followed up with more detailed information from the media. Autodial emergency notification systems relying on landline telephone systems may not work for some categories of people, such as the hearing impaired and those with limited English proficiency. Outdoor sirens or voice systems are expensive and complicated to

¹⁶ Office of Emergency Services, "Standardized Emergency Management System (SEMS) Guidelines", Part I, 2006

¹⁷ Ibid

establish (and maintain). They require an ongoing public education campaigns and are generally limited to a specific threat and geographic area.

There are also lesser used methods of alert and warning, such as “tone alert” radios for key facilities, air craft or public safety vehicle mounted public address systems, and National Weather Radio (NWR).

This mix of alert and warning notification presents many challenges. The public must be educated on a continuous basis about the various systems, and, in a day and age of almost “instant information”; the public has come to expect instant information about emergencies and disasters. Since commercial radio and television stations in many areas are automated, there may be delays in broadcasting of live updated coverage of a local disaster.

There are other challenges as well, including:

- An inconsistent patchwork of systems;
- A lack of pre-scripted messages or the ability to develop on-the-spot information for the public;
- The problem of outdoor notifications, for transient populations such as campers, hikers, the homeless, etc.;
- Notification of those with special needs and vulnerabilities;
- The issue of multiple languages in California.

Alerting and Warning Persons with Disabilities

The Statewide Alert and Warning System, including both the issued warning and sources available to validate the warning, must be accessible to persons with disabilities. According to the 2000 Census, 19 percent of Californians have some disability. In order for alert and warning systems to effectively reach persons with disabilities, the systems should employ a variety of communications methods and multiple formats that are accessible to the targeted population. Accessible formats for deaf and hearing impaired populations include TTY, American Sign Language, and telephone and video relay services; instant messaging and text messages are increasing in use in the deaf community. Accessible formats for blind and low-vision populations include large print, Braille, and magnifiers and screen readers for those using computers. Persons with other disabilities may require other delivery methods or wording. Further development of the

Statewide Alert and Warning System must include representatives of the disabled community.¹⁸

DRAFT

¹⁸ Disability Rights Advocates, Effective Outreach to Persons with Disabilities, June 2007. Although this document addresses guidance for California utilities in outreach to persons with disabilities, the principles appear to be equally applicable to the development of alert and warning systems.

Work Group Process

The process was initiated in March 2008 with the first meeting of the Alert and Warning Working Group (AWWG) held on March 27, 2008. This "kick-off" meeting was the first in a series of meetings to implement the provisions of AB 2231 regarding enhancing alert and warning notification systems in California through public-private partnerships. The workshop focused on obtaining initial information to support AB 2331 implementation, identification of key stakeholders and interested parties, and outlining the process for implementing the project over the next year. At this meeting the participants also agreed to expand stakeholder participation as needed and identified the need to establish subcommittees ("work teams") to address key areas. Subsequent meetings expanded and extended the work begun in March 2008. These meetings were held June 24, 2008; September 18, 2008 and December 2008. Summaries of the meetings are included in Appendix ___ to this report.

Composition of the AWWG and the work teams emphasized the public-private partnership nature of the alert and warning process. Representatives of many aspects of the communications industry, state and local government, and special needs populations actively participated in the AWWG and all of the work teams.

As a result of the input received at the first AWWG meeting, five "work teams" were identified. They are: (1) Technical Issues, (2) Social Issues, (3) Standardization, (4) Funding, and (5) Legal and Liability Issues. Subsequent to this initial identification of focus areas, it was suggested that the last two (Funding and Legal and Liability) issues be merged for purposes of the initial issues identification. Several of the work teams discovered that they had overlapping areas of interest. The issues identified by the work teams have been combined in to common issue areas for the purposes of this report.

The work teams began meeting in May 2008. The process used by the work teams was generally similar. Each initial team meeting involved review of some preliminary information from the members regarding potential priority issues and other discussion areas. As a result of these meetings:

- some items were removed from the particular work team's area of responsibility;
- priority items were identified;
- the work teams began initial issue recommendation development; and
- cross-cutting issues were identified that required joint work with other Work Teams

Throughout the year-long process, particular emphasis was placed on stakeholder involvement, at all levels of government, with the private sector (including vendors) and key nongovernmental organizations. For a listing of work team participants, see Appendix __ to this report.

Technical Issues Work Team

The Technical Issues work team agreed it should focus on issues at a policy level. For the report to the Legislature the team agreed it will be important to identify the current status of alert and warning technology in California and then determine the direction in which the State needs to go.

There was general agreement that alerts and warnings are transmitted to multiple existing delivery systems which were not developed with alert and warning as a primary function. There has not yet been an effort to coordinate these into an integrated system. Industry will play a huge role in the process of further developing the Statewide alert and warning system or system of systems, and if the industry is driving the technology, it is important that those representatives are heavily engaged in the work teams' effort. However, the State's alert and warning system should not be technology driven but user driven; users should decide what the system is to accomplish and technology should be identified to support this.

The work team began with the overall general assumption that whatever alert and warning system solutions are implemented, they must be consistent with the Common Alerting Protocol (CAP).

Social Issues Work Team

At its initial meeting, the group reviewed a presentation prepared by Drs. Dennis Mileti and Erika Kuligowski of the University of Colorado on "Public Warning and Response"; this presentation summarized currently accepted findings regarding the nature of public warning and the public's reaction to them. Several key findings from that presentation were subsequently included in the team's issue discussions and recommendations. The team also addressed the social benefit of public warning.

Standardization Work Team

The work team generally discussed application of national and international standards at the state level, what we will need to put in place in order to facilitate this, and the need to be consistent in the use of terminology.

Legal, Liability and Funding Issues

This work team was the last to meet and addressed issues referred to it by other work groups and identified at the June Work Group meeting. The team focused on current law surrounding alert and warning and any perceived shortfalls.

DRAFT

Issue Identification

Through the process outlined in the prior section, the work teams identified issues in development, implementation, and maintenance of a Statewide Alert and Warning System. Different aspects of many of these issues were identified by multiple work teams. The following listing reflects the combined findings of all of the work teams. Key findings are highlighted in ***bold italics***.

Issue: Structuring California's Statewide Alert and Warning System

Whatever alert and warning system solutions are implemented, they must be consistent with the Common Alerting Protocol (CAP). Adherence to the Common Alerting Protocol (CAP) is essential in assuring interoperability, insuring adaptability to new technologies, and creating a "system of systems".

With the exception of weather alerts from the National Weather Service, virtually all activation of direct emergency alerts to the public occurs locally. These alerts are issued by local emergency managers, who understand the impacts that a specific hazard or event will have on the local community and can communicate to alert recipients the most appropriate actions to take. Developing and maintaining local alert and warning capability is the keystone of a statewide system. However, capability for state officials to activate the system must be retained, both for statewide alert situations and as a backup for local activation, and statewide alerting capability must be seamlessly linked to federal alerting systems, such as those maintained by the National Weather Service or the U.S. Department of Homeland Security. ***California's statewide alert and warning System should be a standardized structure that is implemented locally. The State should maintain the statewide alert and warning system structure.*** The system should support interoperability with local systems, not supplant local efforts. ***Local agencies should be responsible for maintenance of their systems that tie into the statewide public warning system.***

California's Emergency Digital information Service (EDIS) can be made to do all the things the statewide system needs, but it will take continued investment. EDIS uses the Common Alerting Protocol (CAP) that is the backbone of both the federal Emergency Alert System (EAS) and Commercial Mobile Alert System (CMAS) efforts. However, EDIS does not exist as a defined "program" for the purpose of budgetary support. ***There is a need for defined ownership and support (programmatic and financial) for EDIS at the state level. Work Group participants recommend that the Governor's Office of Emergency Services (OES) be given the responsibility and budgetary support necessary to maintain and manage EDIS, including necessary upgrades to maintain consistency with emerging federal alert and warning initiatives.***

The State should continue to take the lead role in further development and maintenance of EDIS in order to assure a common statewide platform. Benefits of having the state continue to maintain and manage EDIS include consistency of message structure across the state; the economies of scale of a single system, including for CMAS interface; and centralized technical assistance, such as providing common guidance on accessibility of systems and messages for special needs populations. Another advantage is uniform authorization and user verification procedures. However, in order to fulfill a statewide alert and warning notification role, EDIS needs enhanced redundancy and programmatic attention to existing shortfalls in functionality.

OES is in the process of updating the State Emergency Plan. The draft Plan (dated July 21, 2008) includes only limited mention of alert and warning as general concepts and provides a general and several scenario-specific flow charts of the "California Warning System". The draft plan does not appear to identify who is responsible for the California Warning System and for issuing warnings. EDIS is not mentioned as part of the warning system and is only briefly mentioned under the section on Public Information.

The state's alert and warning system will need to adapt to the changing federal and technological landscape. ***Whatever alert and warning system solutions are implemented, they must be compatible with work being done at the national level.*** While California's Statewide Alert and Warning System should be a standardized structure implemented locally, national and regional compatibility is very important. The system should be seamless from the federal level to the state level to the regional and local levels. Because EDIS is CAP-compliant and CAP is the foundation of federal efforts, this should be readily achievable.

Issue: System Governance and Maintenance

There will be a need to establish a formal governance structure for the Statewide Alert and Warning System. ***It is recommended that the California Public/Private Partnership for Alert and Warning (Partnership) be created as the basis of this governance.*** The Partnership should be codified in statute (similar to the Public Safety Radio Strategic Planning Committee, Government Code 8592, et.seq.), have program support responsibilities formally assigned to a state agency and have a formal charter established (including goals, objectives, timelines, etc.). A solid governance structure is key to public confidence in the message.

The Partnership should address and involve all aspects of alerting and warning, including EDIS, EAS, and CMAS. The Partnership should include representatives of fixed and mobile device providers, local and state agencies, special needs communities, academics, and other key players. ***The objective of the Partnership should be ongoing support of and accountability for a seamless, integrated standards-based public warning capability.*** One of the roles of the Partnership will be to define what elements

of the statewide alerting and warning system needs to be standardized and what can be locally tailored. Consistency among local programs can be fostered through planning guidance, review of local plans, professional standards of practice, common training, and credentialing.

As discussed in the background section of this report, improving national alert and warning capabilities is a key topic of discussion at the federal level. **However, there is a need for a clear definition of responsibilities at the State level for participation in federal activities; without this California's voice will not be heard.** The Partnership could serve as this voice.

Common "standards of practice", both for when warnings are issued and how they are issued, should be developed. This is a key activity that the Partnership can influence. Developing these standards is key to developing other needed pieces of the system, such as standardized training and evaluation of vendor products for accessibility and effective communication for people with disabilities and other special needs populations. Developing consensus standards of practice for the statewide alert and warning system will support a fully integrated, interoperable system. Processes should also be developed for coordination across jurisdictional boundaries (for multi-county events or where impacts cross county boundaries).

Delivery of alert and warning messages relies upon a variety of commercial networks (telephone, mobile device, internet, cable, satellite, broadcast television and radio) whose primary mission do not directly include delivering alerts and warning messages. Although most commercial providers have embraced their role in the alert and warning process, it is with the understanding that this alert and warning mission not overwhelm the capability of the systems. **Government does not have a role in private network management. In order to assure that the public warning and commercial communications systems support each other, representatives of the commercial networks must be part of the ongoing state alert and warning system governance structure.**

Issue: Crafting the Warning Message

The alert/warning message should directly speak to the action to be taken. The message should address five elements identified in academic research on successful warnings; they should be clear, specific, accurate, certain, and consistent. The message should be simply worded and there should be agreement upon common terminology. Awareness of how words are interpreted by diverse audiences is also needed. Likewise the variations and limitations of different delivery methods should be considered.

Templates should be developed for common warning situations. Different templates may be needed for different devices (e.g., character limitations for text messages, following the format of CMAS). Some agencies, such as the California Highway Patrol (for AMBER Alerts) or California Department of Transportation (for highway reader signs), may already have templates or messaging guidelines. **Messages should include identification of a source for additional information** and there should be a clear differentiation between warning messages, follow-up information, and general public education.

Several different populations have a need to have a message crafted or translated to meet their particular needs, although meeting the preferences for 100 percent of the population may not be feasible. Differing needs include type of media used, cultural considerations, transient populations, etc. The intent of the warning message may not always be accurately portrayed by a word for word translation in another language. How the message will be received (audio, text, video, etc) needs to be addressed along with content. Cultural considerations need to be considered in the crafting and delivery of the message (e.g., gender of person delivering the message, law enforcement vs. fire services). Changing demographics are also likely to impact alert and warning in California. Different age groups, for one, have different preferences in technology. Development of templates will make translation easier.

The work team knows of no automated translation technology that has proven to be effective enough to be used for public safety; there is a need to define minimum performance standards for these systems. Translation from spoken languages to American Sign Language (ASL) is particularly challenging. Translation could occur at the originator, middleware/aggregator, or client level. The need for appropriate translation to multiple communities underscores the importance of having a system employing many different methodologies of dissemination. There is a need for additional information on technologies that may be available for “automatic” translation of alert and warning messages. In addition, there is a need for more qualified translators in order to assure timeliness of translations in instances when “automatic” translation is not available.

Warning response research indicates that message recipients will seek corroboration of the information contained in the message. Corroboration from formal and informal sources must be anticipated and considered as part of the overall warning “system”. The role of public-private partnerships, community based organizations, non-governmental organizations, and other sources in distributing and verifying warning information should be addressed. A source of additional information should be included in alert and warning messages.

Who delivers the warning message is central to its perceived validity and relevance. Is the source credible? How is “credible” determined? Warning system managers and

message creators must account for cultural differences/preferences for who issues a “valid” message. Is the source relevant to the location where the warning is being issued? This may be key for warnings that are directed to a region rather than a single jurisdiction (for example, in the event of a repeat of the 1991 East Bay Hills fire, will Berkeley residents evacuate based on an alert issued by Oakland officials?).

Although warning systems strive to reach as much of the population in the target area as possible, it is important to remember that a warning message or alert may not reach everyone. No warning system can guarantee that all will receive and react appropriately to the message.

It is also likely, especially when issuing a warning via broadcast media, that the message will reach unintended audiences. This emphasizes the importance of making warning messages as comprehensive as possible as to who the message is directed to and what actions the intended audience is to take and when.

Issue: Alert and Warning Technology

The state needs an operational alert and warning platform that can adapt to changing technology, both in terms of message input and output (for the message recipient). The system must also be able to adapt to changes in protocols and procedures, evolving management structures, and the like. ***The system must be able to deliver a single message to various recipients through various media. These various media must be virtually equivalent to each other from the message input perspective (i.e. “plug and play”), so that the operational processes for the message issuer do not change whether the message is sent to mobile devices, computers, wireline phones, or whatever communications technologies arise in the future.***

An interoperable or “plug-n-play” based system will yield the best results. The team thought that pursuing a common “exchange” (middleware) solution rather than emphasizing a “mesh” architecture solution may be the most readily achievable. (For the differences in “exchange” and “mesh” architecture, see the diagram in Appendix ___ to this report.) Communications technology will continue to rapidly change. The alert and warning system adopted by the state must be flexible enough to adapt to, not preclude, future changes. System governance must include on-going evaluation and continuous improvement.

Most alerts and warnings are issued at the local government level. Many local governments have invested in various types of alert and warning technologies. ***The pending OES contract to gather information on the various technologies currently in use and their capabilities (including accessibility of the warning messages to the disability community) will be valuable in designing a solution that can accommodate these prior investments. It reiterates the need for a “plug and play” solution designed as a “system***

of systems" incorporating the capabilities and investments of local governments. EDIS has the capability to link with most of the existing alerting systems. **Procedures and protocols for coordinating and reconciling alerts and warnings that impact multiple local jurisdictions are also needed.**

In order to have an effective warning system, the alert and warning system needs to reach all phones and devices that are in use by humans within a particular area at the particular time the warning is issued. ("In use by humans" is meant to exclude those phones/devices assigned to fax machines, ATMs, alarm circuits, etc.) One of the most commonly used methods of alerting the public is telephonic emergency notification systems. However, the reach of these systems is currently limited to locations with conventional landline phones, unless individuals using other types of telephone service (TTY, mobile phones or voice over internet protocol [VoIP]) have registered to receive the alerts. According to the California Public Utilities Commission, only 87 percent of California homes have landline service. In fact, there are more mobile subscribers in California than wireline subscribers.¹⁹ Use of traditional landline phone service varies greatly by community, with lower percentages of landline customers among younger customers and poorer communities. Transient populations (such as commuters and tourists) in an alert area may not be in reach of landline service. **In order to reach all population within the alert area, there may be a need for access to proprietary information on mobile, VoIP, and other non-landline personal devices.** This access must be obtained in such a way as to protect companies against unauthorized system access or use of customer data. Generally, the more advanced the technology, the less the ability of the State (e.g., California Public Utilities Commission) to regulate those providers.

All available methods and options should be used to issue an alert. **Redundancy is essential for reaching different recipient groups.** Reaching rural populations may also require different strategies than reaching urban populations. Warning system protocols must address worst case situations, such as power outages or a Katrina-like situation where local television and radio stations are not functioning. Also, there should be a focus on public education regarding personal responsibility to receive, understand, and respond appropriately to messages.

Issue: Alert and Warning Accessibility

Achieving accessibility of alert and warning messages by recipients with sensory disabilities is a distinctly different challenge from spoken language translation. **The team believes that sensory disability learning preferences may already have been defined and this research needs to be built into any alert and warning system solutions. There is**

¹⁹ CPUC Report: Residential Telephone Subscribership and Universal Service, June 2008.

a need for a solution that can take a single message and translate it accurately to multiple special needs delivery methods. Text messages generated by the State's alert and warning system need to be accessible to devices, such as TTY and screen readers, used by special needs populations. Also, the system must be flexible enough to integrate with emerging technologies, such as video phones and portable video devices. Technical standards for systems/devices for transmitting alerts and warnings to disabled community are needed. Agencies procuring local warning systems need to test them for this access prior to any commitment to purchase vendor products or services. Sources for follow-up or updated information must also be accessible.

As "standards of practice" are developed they should include standards for evaluation of vendor products for accessibility and effective communication for people with disabilities and other special needs populations. Development of message templates should also account for translatability into various media and languages.

Issue: Legal/Liability

California law does not include an obligation on the part of government to issue a warning. The ability of government to issue a warning stems from the general responsibility of government to protect public health and safety; it is also tied to an ethical responsibility to provide citizens with critical emergency information. Authority to issue warnings in a given geographical area is usually defined in emergency plans. The work group believed that either further codifying an obligation to warn or defining who is required to issue warnings would not be advisable. Would defining authority to issue warnings inadvertently assign authority to someone who does not want or cannot fulfill that responsibility or take it away from someone who can fulfill the responsibility? Would defining authority to issue warnings inadvertently put local governments at high risk for liability lawsuits?

Fear of increased liability should not deter local jurisdictions from investing in warning system technology appropriate for their community. As there appears to be little case law on the topic of public alert and warning, several questions linger. In particular, is **liability** tied to the inherent **ability** of the jurisdiction to issue a warning? Does the greater warning capability that a jurisdiction possesses change its liability exposure?

There is a need for "Good Samaritan" protection for those that issue or relay a legitimate warning. Public policy should promote sharing of critical emergency information in a timely manner. **However, liability limitations for all parties issuing and delivering alert and warning messages must be contingent on compliance with operational standards.** Liability protection should be provided for all partners in the warning system if their actions are in good faith, based on credible information, and consistent with accepted professional standards. Communications carriers transmitting

a warning from an authorized government representative to the public in the impact area should be protected from liability when managing their networks in emergency situations with already large call volumes. Liability exposure should be minimized if the message initiators follow these accepted standards of practice, including attribution of the message to its source. Although "Good Samaritan" protection should be codified in statute, standards of practice should be defined and then approved by warning professionals in a public process but not permanently defined in statute so as to allow for changing communications technologies. There may be varying ways of achieving such standards.

(Comment: Need to provide some additional information on "emergency notification vendors" such as how their industry functions (i.e. general contract terms, that individual localities enter into their own contracts with the vendors, what services the vendors provide, etc. to help put this in context.) There are no existing minimum performance standards for emergency notification system vendors operating in California. Many of the vendors are not located in California, so the state's ability to regulate them may be limited. However, if a company does business in California, it must comply with our State laws. **There is a national effort to develop emergency notification vendor performance standards and California should actively participate in those efforts²⁰. The governance structure should also provide tools for local agencies' use in evaluating, procuring, and implementing such vendor products.**

Issue: Funding

Warning systems should be viewed in the context of California's mutual aid system:

local jurisdictions fund their own programs and cooperate county-wide in their operation in a coordinated effort. The state system (EDIS-based) exists to support these local efforts, including providing a way for those jurisdictions without a local warning system to access the EAS. As EDIS provides a backbone for the statewide alert and warning mutual aid system, funding must be provided to support it. In addition to supporting the state hub, funding could be provided for support of local capabilities, similar to the way in which the OES fire engine program supports both local capability and the statewide mutual aid program. The role of EDIS in the statewide alert and warning mutual aid system must be addressed in the State Emergency Plan.

In order for EDIS to provide this pivotal role, (1) emergency managers must be able to count on it being there and being supported; (2) technology must be kept up-to-date; (3) emergency managers, broadcasters, and other partners must know how to access

²⁰ Alliance for Telecommunications Industry Solutions (ATIS) news release "ATIS Announces Initiative to Coordinate Standards for Emergency Notification Systems", March 27, 2008.

and effectively use it; and (4) the system must be maintained. ***This will require a secure, dedicated source of funding for EDIS. Funding will also be required to support the governance system.***

As standards are developed for components of the alert and warning systems, such as emergency notification system vendors, compliance with those standards should be made a requirement for use of state or federal funding to procure such components.

Issue: Evaluation

Part of developing the alert and warning system and standards of practice is defining "success" so that the system can be evaluated and modified. ***It was generally agreed that overall system success should be measured by the extent of compliance with the official recommendations reflected in the warning message.*** This has three sub-elements: reaching the maximum population within the area affected by the warning, stimulating that population to take the appropriate action and ensuring that critical communications infrastructure is not adversely affected.

Standards/targets for various elements of the warning system should be established where they do not currently exist. This should include metrics for technical reach of various warning systems, reliability, and timeliness of issuing the warning. Setting standards also will involve the difficult discussion centering on at what point the cost of providing the alert to the last person exceeds the value of functionality of the system. After-action reporting and evaluation criteria should be established. A uniform data collection process should be established for purposes of evaluating the system and directing improvements to all aspects of it.

Issue: Training, Credentialing, and Identity Management

There is a need to develop standardized alert and warning training tied to and consistent with SEMS and NIMS. Alert and warning training should be part of Operations Section training curriculum developed to support SEMS and NIMS. Training needs to address creation of the message as well as in use of the system. Refresher training on standard procedures is critical. Training programs need to recognize that making the decision to issue an alert or warning and the operation of the alerting system are distinctly different tasks, and also will likely be performed by different personnel. And in most situations, those making the recommendation to the Incident Commander to issue a warning and those operating the alerting system will not be the incident public information officer. It's important to keep in mind that there is a difference between "alert" and "information." Training should address both the rationale and process for

issuing alerts and the need to follow-up alerts with public information to provide supplemental and updated information. The transition from “warning” to public information should also be addressed in training programs.

Also important are credentialing and identity management. Identity management addresses how authorized users (message originators and distributors) are identified, validated, and credentialed. ***There is an ongoing effort by with the Department of Homeland Security to develop and implement an identification (ID) “smart card”; use of this initiative to manage access to the alerting/warning system should be explored.*** For example, could the ID card serve as a keycard for the message originator to unlock access to the alert and warning system? Currently local government manages who has authority to issue warnings through their local alerting system and this level of governance must be maintained. However, a common credentialing structure will a number of functions, including regional (cross-county) warning systems and statewide interoperability. ***Alert and warning credentialing should be part of the NIMS-required emergency management credentialing effort.***

Another important element relates to granting access by non-governmental warning system partners into the disaster area (e.g., to repair tower sites), providing them logistical support (e.g., fuel for generators) and the like. Participation by these partners in state and local planning, training, and exercises is critical to building this understanding.

Standards should also be set for testing of alerting and warning systems. The work team was not in agreement that complete testing of alert and warning systems as part of emergency response exercises was necessary, although the alert decision-making process and message creation should be part of exercises. System activation tests could be done separately. Criteria for evaluating system tests should be established. Education and a consistent testing program are key to mitigating unintended consequences, such as post-test calls to 9-1-1.

Issue: Public Education

Successful alert and warning requires action on the part of the message receivers (the public). ***An effective public education campaign – including the what, where, when, who, why, and how alerts are issued, the limits of public warning capabilities and appropriate responses to warning messages – is necessary for an effective public warning system.***

The public needs to understand how the alert and warning system works, especially in their local area. Outreach/public education is needed giving the public more information about the source of warning messages, who issues warning, how they are

issued, appropriate responses, etc. There is also a concern that some consumers of non-wireline telephones may not realize that they will not receive locally generated telephone warnings if they have not explicitly registered with their local government for participation. Companies providing these services should make their customers aware of this. Warnings need to be supported by on-going follow-up information (status, etc.)

More needs to be done to elicit appropriate public response to alerts and warnings. Alert and warning information should be made a prominent element of general emergency preparedness campaigns. In addition, specialized public education campaigns are needed to target the divergent requirements of California's diverse disability, language, and cultural communities. Training on alerts and warnings (and on emergency preparedness in general) should be required in K-12 curriculum. Nonprofit organizations, community- and faith- based service organizations, and similar groups can play a role in training and promoting appropriate response to warnings.

Public education efforts should promote realistic expectations about post-event communications.

To the extent to which the public alert and warning system depends upon commercial networks, the limitations of those systems must be recognized. The public expects that landline telephone, cellular phones, and mobile devices will all be available after a disaster, but this may not be true.

Issue: Integration of Warning with Emergency Public Information Systems and Information Resources

It's important to keep in mind that there is a difference between "alert" and "information." ***Procedures and protocols for implementing the alert and warning system should address the need to follow-up alerts with emergency public information to provide supplemental/updated information and articulate the transition from "warning" to emergency public information.***

Optimally, an alert and warning system would incorporate an interactive "feedback loop" that would allow the message sender to validate that the message has been correctly interpreted and the message receiver to corroborate the warning message and obtain further information. However, there is also a need to be cognizant that an interactive system will potentially clog phone systems, so corroboration calls should be efficient in dissemination and duration. Also, it is critical that both warning messages and subsequent emergency public information clearly state the area impacted by the warning/event. This is particularly critical for events occurring in large media markets where only a portion of the area is impacted.

Procedures regarding issuance of warning messages must include cross notification to elements of the emergency response organization where message recipients may turn for information. This includes 9-1-1 dispatchers, and local 2-1-1 or 3-1-1 systems if such systems are active locally.

The system must anticipate a range of responses to alert and warning messages – some of those hearing the warning will do strange things, some will do nothing, and some that didn't need to do anything will respond.

Provision of warning information, to the families of first responders is a unique subset of "the public". This communication needs to be interactive – both to the families and feed-back to the responders that their families have received the warning and are taking appropriate action. Agencies with emergency response functions may want to consider establishing an ombudsman position, family "telephone trees", a call-in center or other central point of contact, website messaging, or other means for facilitating communication between responders and their loved ones.

Legislation Requirements

- Creation of the California Public/Private Partnership for Warning.
- Codification of liability limitations for all parties issuing and delivering alert and warning messages, provided that operational standards are met